PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of: Flecknoe-Brown et al. **Application No.:** 10/580,524 **Confirmation No.:** 4216 **Filed:** May 24, 2006 For: CONTROL OF OXYGENATION Group: 1794 Examiner: Anthony J. Weier	Our File: MOR3-PT022 Date: January 29, 2009

DECLARATION OF ANTHONY EARL FLECKNOE-BROWN PURSUANT TO 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Anthony Earl Flecknoe-Brown, declare that:

1. I am a named co-inventor inventor of the subject matter described and claimed in the above-identified patent application.

2. I have been in the business of designing, manufacturing, and marketing various thermoplastic forming processes, thermoplastic products, containers, liners, and drains for over 25 years.

3. I have developed inventions covered in the following U.S. patents:

6,123,222 Package and system for dispensing preformed nurser sac;
5,806,711 Nurser liner;

5,617,972	Nurser liner;
4,994,229	Forming thermoplastic web materials;
4,722,820	Molten theromplastic web feeding process;
4,639,165	Drainage tube;
4,543,054	Thermoforming machine;
4,480,979	Stretch forming hollow articles; and
4,288,401	Thermoplastic forming process.

4. In view of my experience over the last twenty five years, I would be considered to be a person skilled in this art.

5. I reviewed the September 5, 2008 Office Action ("Action"), including the 35 U.S.C. §103 rejections of claims 22 and 23 as obvious over AU 71589/74 (Reckitt & Colman) and U.S. pre-grant Application Publication No. 2003/0194302 (Hickinbotham); claims 24 – 26 as obvious over Reckitt & Colman in view of Hickinbotham and U.S. pre-grant application publication No. 2004 0226451 (Diaz); and claim 27 as obvious over Reckitt & Colman in view of Hickinbotham, Diaz, and French Publication No. 2 736 923.

6. I studied Reckitt & Colman, Hickinbotham, Diaz, and French Publication No. 2 736 923 and the Examiner's reasons for rejecting claims 22 – 27 as unpatentable over Reckitt & Colman and Hickinbotham or Reckitt & Colman and Hickinbotham in combination with the other cited prior art references, as listed above.

7. Independent claim 22 of the above-identified application recites:

A method of maturing wine in bulk comprising,

> storing the wine in a closed container over a period of at least four months, the container having a capacity of at least 225 litres and self supporting walls, the walls having an exterior exposed to the atmosphere,
>
> wherein the walls of the container comprise polyethylene which allows oxygen to permeate the walls directly from the atmosphere into the wine in contact with the walls at a rate less than 80 milligram of oxygen per litre of wine per year. (Underline emphasis added).

8. With respect to Reckitt & Colman, the Action states:

> AU discloses a method of controlling the rate of oxygen transfer in a container of wine by providing a closed container (Figure 1) made of a material which is permeable for the introduction of oxygen into the packaged wine at a particular rate (e.g. page 8). (Action, page 3).

9. With respect to the combination of Reckitt & Colman and Hickinbotham, the Action states:

> The claims differ in referring to the specific rate of transmission of oxygen to within said container. It should be note [*sic*], however, that such a determination would have been well within the purview of one skilled in the art. The suggestion in determining such rate is dependent on several variables including the thickness and particular type of container material as well as speed of maturation of the wine desired as taught, for example, in Hickinbotham (e.g. Paragraphs 91 and 92). It would have been obvious to one having ordinary skill in the art at the time of the invention to have arrived at such rate of permeability through routine experimental optimization. (Action, page 4).

10. Each of the rejections in the Action, and listed above, rely on the alleged teachings of Reckitt & Colman and Hickinbotham as repeated in paragraphs 8 and 9, above.

11. Each of the rejections in the Action also rely on the Examiner's conclusion that i) the rate of oxygen transfer to within the container "would have been well within the purview of one skilled in the art," ii) Hickinbotham suggests parameters to adjust to obtain the claimed rate of oxygen transfer, and iii) it "would have been obvious to one having ordinary skill in the art at the time of the invention to have arrived at such rate of permeability through routine experimental optimization."

12. Reckitt & Colman is directed to the manufacture of sherry style wines. See Reckitt & Coleman, page 2. The disclosure of Reckitt & Coleman is limited to sherry style wines.

13. The goal of the method taught by Reckitt & Coleman is to speed up the sherry maturation process.

14. In discussing conventional prior art processes for wine maturation, Reckitt & Coleman states, "[d]isadvantages of the solera process are that considerable storage space is required and capital, in the form of maturing wines and casks is tied up for excessively long periods." Reckitt & Colman, page 2.

15. The *solera* process relates to the manufacture of sherry and other fortified wines. It is not used for dry table wine

16. Reckitt & Colman continues to discuss speeding up maturation, and it is clear from the succeeding description that substantial exposure to oxygen is required to speed up the process. See Reckitt & Colman, page 3.

17. Reckitt & Colman further states:

> for large scale wine production, however, it may be desirable to pass the young wine or must through a series of pipes of the oxygen permeable plastic material during maturation so as to ensure there is sufficiently large surface area of the wine or must is allowed to contact an oxygenated gas, generally the atmosphere, by the oxygen permeable material. (Reckitt & Coleman, page 8).

18. As outlined in paragraphs 12 – 17, Reckitt & Colman relates to providing a high oxygenation rate in the manufacture of sherry style wines, in order to provide rapid maturation with a very high rate of oxygen absorption, so that maturation occurs rapidly, *i.e.* in weeks. See, also, Reckitt & Colman, Example 2 (sherry produced is bottled at a mere four weeks).

19. The nature of beverage being treated in Reckitt & Colman is quite different from wine matured in the method of claim 22, which recites:

> A method of maturing wine in bulk comprising,
>
> storing the wine in a closed container over a period of at least four months, ...
>
> wherein the walls of the container ... allows oxygen to permeate the walls directly ... at a rate less than 80 milligram of oxygen per litre of wine per year. (Underline emphasis added.)

20. As explained in the instant application, the infusion of high rates of oxygen results in formation of acetaldehyde. See page 3, lines 27 – 33. This gives an undesirable spoiled taint, *i.e.* volatile acidity, to wine and must be avoided.

21. Sherry derives its distinctive character from the presence of significant amounts of acetaldehyde, and even if a small fraction of acetaldehyde typically found in sherry was present in wine produced according to the claimed method, that wine would be considered spoiled, *i.e.* excessively oxidized.

22. The rate of oxygenation in wine matured in bulk for a period of at least four months needs to be controlled at levels substantially below those applicable for sherry.

23. To store wine under the teachings of Reckitt & Colman for at least four months would result in wine that is completely tainted and undrinkable.

24. One of ordinary skill in the art would not consider using Reckitt & Colman to develop matured wine as claimed, as the technique of Reckitt & Colman would lead to spoilage, and teaches away from the claimed invention.

25. Hickinbotham relates to a flexible bag container with a support structure, the construction being such that the container is designed for grape must fermentation with provisions for venting excess carbon dioxide and controlling gas flow between the grape must and the container exterior.

26. Hickinbotham goes into considerable detail in relation to fermentation of must and is clearly focused on this aspect. See, *e.g.*, Paragraph 2.

27. In a section of Hickinbotham headed "wine maturation" there is reference to "allow[ing] varying levels of carbon dioxide and oxygen to permeate ... creating opportunities for medium and slow maturation." Hickinbotham, Paragraph 92. However, Hickinbotham, does not suggest that the "maturation" is other than the time during the initial fermentation stage, which is relatively short, typically a few days.

28. Hickinbotham teaches away from slow maturation over a long period and also teaches that the flexible bag described has a high rate of oxygenation leading to "rapid maturation." See Paragraph 91.

29. Maturation during the short fermentation stage is quite different than the maturation envisaged for the claimed invention, which corresponds to maturation in wine barrels over periods of months or years after fermentation.

30. There is no suggestion in Hickinbotham that the wine and entrained grapes should be left in the container to mature together over a long maturation period, and to do so is clearly inappropriate for maturation of wine.

31. Furthermore, there is no description indicating that the wine should be drained from the container and separated from the fermentation by-products before being placed in another similar container for maturation over a long period.

32. A person of ordinary skill in the art reads Hickinbotham as directed to fermentation, not maturation, and would not look to Hickinbotham to develop a method for maturing wine in bulk, as claimed.

33. Hickinbotham teaches a flexible bag for holding the product to undergo fermentation. See, *e.g.* paragraph [0052]. In contrast, claim 22, as amended, recites: "the container having a capacity of at least 225 litres and self supporting walls..." A person of ordinary skill in the art would thus not look to Hickinbotham in attempting to develop a method for maturing wine in a container having self supporting walls.

34. Hickinbotham, taken alone or in combination with Reckitt & Colman, fails to teach or suggest:

> A method of maturing wine in bulk comprising,
>
> storing the wine in a closed container over a period of at least four months, the container having a capacity of at least 225 litres and self supporting walls, the walls having an exterior exposed to the atmosphere,
>
> wherein the walls of the container comprise polyethylene which allows oxygen to permeate the walls directly from the atmosphere into the wine in contact with the walls at a rate less than 80 milligram of oxygen per litre of wine per year. (Underline emphasis added.)

35. Contrary to the assertions in the Action, Hickinbotham does not suggest parameters to adjust in order to obtain the claimed rate of oxygen transfer, because, as noted above, Hickinbotham contains no teachings with respect to the rate of oxygen transfer for maturing wine in bulk where the wine is stored in a

container having self supporting walls, as claimed. Additionally, a person of ordinary skill in the art would be deterred from looking to Hickinbotham because the very section cited by the Action as suggesting parameters to be adjusted to reach the claimed ratio, actually teaches away from use of the device for long term wine maturation of "at least four months." Hickinbotham, paragraph 91.

36. Contrary to the assertions in the Action, development of the claimed method for maturing wine required substantially greater effort and ingenuity than "routine experimental optimization."

37. Despite a series of steps and trials over a period of two years, the inventors had to discover an unpredictable relationship that led to the discovery of a method, as recited in the pending claims, that produced a satisfactory product.

38. The oxygen permeability of large (approx. 10,000 L) tanks is much lower than that of the typical oak barrels conventionally used.

39. The inventors first developed a range of polyethylene based bulk wine storage tanks considered safe for the long term storage of wine. The smallest tank considered safe at that time was 2,500 L in capacity and had an oxygen permeability rate of about 4.6 mg/L/year, which is only a small fraction of the typical rate of a barrique. Due to the low oxygen permeability, the tank was considered safe for long term wine storage use without risk of oxidizing the wine, i.e. not capable of maturing wine at barrel rates.

40. The inventors subsequently endeavored to develop a tank suitable for wine maturation, having a capacity in the range of commercially used oak casks. Typical sizes for oak casks are 225 L (Barriques), 300 L (Hogsheads), and 500 L (Puncheons) or multiples thereof.

41. The inventors discovered that tanks suitable for maturation would require a much thinner-walled polymer container than was typical of their polyethylene storage tanks then being manufactured, in order to supply a sufficient level of oxygen to the wine being matured.

42. It was not clear at that time whether it would be possible to manufacture a large capacity polyethylene tank (*i.e.*, having a capacity of at least 225 L), with walls thin enough to allow adequate transmission of oxygen for wine maturation, yet strong and rigid enough to be self supporting. It was also not clear whether tanks could be produced by rotational molding with thin walls which were uniform in thickness, and hence could give predictable oxygen transmission.

43. The inventors concluded that such a tank would need to have a 'stretched-out' shape with a relatively high ratio of surface area to contained volume. This presented a challenge because it was also very important that such a tank be self-contained, *i.e.* rigid enough to support its own shape, which would be difficult to produce using a ductile material such as polyethylene.

44. It was not predictable whether it was possible to achieve an appropriate degree of permeability in a larger rigid vessel of a practical commercial size, of similar capacity to or greater than that typically associated with the common range of oak barrel sizes.

45. It was only after considerable efforts that the inventors discovered a maturation tank that had a suitable permeability and that was also thick enough to be self supporting and 'rigid.'

46. With these constraints in mind, the inventors were able to eventually develop and test a tall, 'stretched-out' vessel of 1,000 L capacity. This vessel had a surface to contained volume ratio of about 6 m^2 of wall surface area for each 10 hL of volume, and, unexpectedly, a permeability of about 17 mg/L/yr.

47. The inventors found that this level of permeability was approximately equal to that of a conventional barrel of two to three years of age, and could therefore be used in existing cellars in combination with other barrels, with no change in winemaking practice. It was the discovery of this unexpected combination of properties that enabled the inventors to develop the claimed invention.

48. Since development and testing of the initial barrel described above, the inventors have developed maturation tanks of other shapes and sizes, all of which are based on the unique and unexpected relationship of parameters discovered.

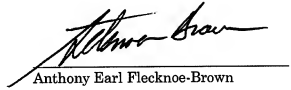
This relationship of parameters is expressed in terms of an oxygen permeability of less than 80 milligrams of oxygen per litre of wine per year in the pending claims.

49. As set forth above, the claimed invention did not occur due to routine experimentation, but by determination of a novel and non-obvious combination of factors that were fortuitously and unexpectedly discovered.

50. I have been warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001) and may jeopardize the validity of the application or any patent issuing thereon.

51. I declare under penalty of perjury under the law of the Unites States of America that the foregoing is true and correct.

Executed this 29th day of January, 2009 at Melbourne, Australia



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